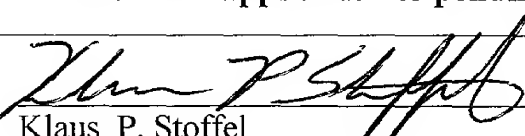


JC11 Rec'd PCT/PTO 2 8 FEB 2001

FORM PTO-1390 (REV 10-94)		U S DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		DOCKET #: 4595-18PUS
<b>TRANSMITTAL LETTER TO THE UNITED STATES</b> <b>DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING</b> <b>UNDER 35 U.S.C. 371</b>				
				U.S. APPLICATION NO. <small>(if known, see 37 CFR 1.5)</small> <b>097786045</b>
INTERNATIONAL APPLICATION NO <b>PCT/IB99/01560</b>		INTERNATIONAL FILING DATE <b>August 27, 1999</b>		PRIORITY DATE CLAIMED <b>August 29, 1998</b>
TITLE OF INVENTION <b>Method And Device For Producing Card-Like Information Carriers</b>				
APPLICANT(S) FOR DO/EO/US <b>Werner VOGT</b>				
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information: <ol style="list-style-type: none"> <li><input checked="" type="checkbox"/> This is a <b>FIRST</b> submission of items concerning a filing under 35 U.S.C. 371.</li> <li><input type="checkbox"/> This is a <b>SECOND</b> or <b>SUBSEQUENT</b> submission of items concerning a filing under 35 U.S.C. 371</li> <li><input checked="" type="checkbox"/> This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).</li> <li><input checked="" type="checkbox"/> A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.</li> <li><input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371(c)(2))             <ol style="list-style-type: none"> <li><input checked="" type="checkbox"/> is transmitted herewith (required only if not transmitted by the International Bureau).</li> <li><input type="checkbox"/> has been transmitted by the International Bureau.</li> <li><input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US)</li> </ol> </li> <li><input checked="" type="checkbox"/> A translation of the International Application into English (35 U.S.C. 371(c)(2)).</li> <li><input type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))             <ol style="list-style-type: none"> <li><input type="checkbox"/> are transmitted herewith (required only if not transmitted by the International Bureau).</li> <li><input type="checkbox"/> have been transmitted by the International Bureau.</li> <li><input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired.</li> <li><input type="checkbox"/> have not been made and will not be made.</li> </ol> </li> <li><input type="checkbox"/> A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).</li> <li><input checked="" type="checkbox"/> An EXECUTED oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).</li> <li><input type="checkbox"/> A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).</li> <li><input checked="" type="checkbox"/> Applicant claims small entity status</li> </ol> <b>Items 11. to 16. Below concern other document(s) or information included:</b> <ol style="list-style-type: none"> <li><input checked="" type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98.</li> <li><input type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.</li> <li><input checked="" type="checkbox"/> A <b>FIRST</b> preliminary amendment.  <input type="checkbox"/> A <b>SECOND</b> or <b>SUBSEQUENT</b> preliminary amendment.</li> <li><input type="checkbox"/> A substitute specification.</li> <li><input type="checkbox"/> A change of power of attorney and/or address letter.</li> <li><input checked="" type="checkbox"/> Other items or information (<i>specify</i>): PCT Publication Sheet, Int'l Preliminary Examination Report, Int'l Search Report, Written Notification, Notification of Receipt of Record Copy, Information Concerning Elected Offices Notified of Their Election, Information Disclosure Statement</li> </ol>				

U.S. APPLICATION NO. (If known, see 37 CFR 1.6)		INTERNATIONAL APPLICATION NO		ATTORNEY'S DOCKET NUMBER	
09/786045		PCT/IB99/01560		4595-18PUS	
17.[x]The following fees are submitted:					
<b>Basic National Fee (37 CFR 1.492(a)(1)-(5)):</b> Search Report has been prepared by the EPO or JPO ..... \$860.00 International preliminary examination fee paid to USPTO (37 CFR 1.482).....\$690.00 No international preliminary examination fee paid to USPTO (37 CFR 1.482) but international search fee paid to USPTO (37 CFR 1.445(a)(2)) ..... \$710.00 Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO ..... \$1000.00 International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(2)-(4)..... \$100.00					
ENTER APPROPRIATE BASIC FEE AMOUNT =				\$860	
Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)).				\$	
Claims	Number Filed	Number Extra	Rate		
Total Claims	13 - 20 =	0	x \$18.00	\$	
Independent Claims	2 - 3 =	0	x \$80.00	\$	
Multiple dependent claim(s) (if applicable)			+ \$270.00	\$	
TOTAL OF ABOVE CALCULATIONS =				\$860	
Reduction of 1/2 for filing by small entity, if applicable.				\$430	
SUBTOTAL =				\$430	
Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)).				\$	
TOTAL NATIONAL FEE =				\$430	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by the appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property				\$	
TOTAL FEES ENCLOSED				\$430	
Amount to be refunded:				\$	
charged:				\$	
a. [x]One check in the amount of \$ 430 to cover the above fees is/are enclosed. b. <input type="checkbox"/> Please charge my Deposit Account No. 03-2412 in the amount of \$_____ to cover the above fees. A duplicate copy of this sheet is enclosed. c. [x]The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 03-2412. A duplicate copy of this sheet is enclosed.					
<b>NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.</b>					
SEND ALL CORRESPONDENCE TO: Klaus P. Stoffel Cohen, Pontani, Lieberman & Pavane 551 Fifth Avenue, Suite 1210 New York, New York 10176			 Klaus P. Stoffel Registration Number: 31,668 Tel: (212) 687-2770		

By Express Mail # EL 727707732 US · February 28, 2001

Attorney Docket # 4595-18PUS

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re National Phase PCT Application of

Werner VOGT et al.

International Appln. No.: PCT/IB99/01560

International Filing Date: August 27, 1999

For: Method And Device For Producing Card-Like  
Information Carriers

**PRELIMINARY AMENDMENT**

Assistant Commissioner for Patents  
Washington, D.C. 20231  
**BOX PCT**

S I R:

Prior to the issuance of a first Office Action and simultaneously with the filing of  
the present application, please amend said application as follows:

In the Specification:

Please amend the specification as follows:

Page 1, delete line 3 and insert --BACKGROUND OF THE INVENTION--

;

Page 4, after line 4, insert --SUMMARY OF THE INVENTION--;

Line 10, delete "Advantages of the invention";

the paragraph starting at line 11:

The method according to the invention achieves this object by avoiding the discharge of heat energy in the boundary regions of the cavity of the laminator or, which is synonymous therewith, by maintaining and, as it were, concentrating the heat back through the mold onto the inserted card which is to be laminated or onto the laminate, it is ensured that said mold reaches the precise softening temperature required for the laminating process in the boundary regions at the same time as in the central region. This not only results in an elegant appearance of the entire finished product over its entire surface, but also in the certainty that the layers of the laminate which are to be laminated to one another are also satisfactorily connected to one another especially in the boundary region and that when an individual layer is inserted, the boundary region thereof obtains the same degree of lamination as the central region.

Page 5, delete line 20 and insert --BRIEF DESCRIPTION OF THE DRAWING--.

Page 6, delete line 1 and insert --DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS--;

the paragraph starting at line 18:

In the attached drawing, the sizing laminator is denoted by 12 and comprises an upper heating plate 2 and a lower heating plate 6 which, in conjunction with a frame 7, form a cavity which is used for holding the material to be laminated.

Page 7, the paragraph starting at line 1:

It can furthermore be seen that in order to apply the required pressure in the case of the exemplary embodiment illustrated in the drawing of a laminator 12, the lower heating plate 6 corresponds with the greatest possible accuracy to the internal dimensions of the frame 7 and therefore also to the final dimensions of the card which is to be produced, with the result that this heating plate can be inserted, from below in this case, into the cavity 7a which is formed by the hollow space of the frame 7.

Page 8, the paragraph starting at line 1:

The upper cooling body 2 overlaps the frame 7 preferably on all sides by way of a lip 2a projecting all around, with the result that it rests, as it were, as a lid on the frame 7, in which case, with stationary positioning of the upper heating plate 2 together with the assigned cooling body 1, the frame 7 can be mounted in a moveable manner and is pressed by dedicated prestressing means 10 by an appropriate pressure from below against the upper heating plate 2. This firm bearing and boundary-side overlapping of the frame structure by the cooling-body lip 2a ensure that at least on the upper surface of the finished card a satisfactory, also visually attractive lamination is obtained together with a precise boundary edge for the card which is

produced to size. Of course, in this completed version this is not possible for the lower boundary-edge corner region of the card, since the laminating pressure has to be applied and, for this purpose, the lower heating plate 6 has to have a clearance, even if only very slight, from the inside dimensions of the frame in order to enable it to be able to be moved relative to the frame 7.

Page 10, after line 18 insert:

--Thus, while there have been shown and described and pointed out fundamental novel features of the present invention as applied to a preferred embodiment thereof, it will be understood that various omissions and substitutions and changes in the form and details of the devices illustrated, and in their operation, may be made by those skilled in the art without departing from the spirit of the present invention. For example, it is expressly intended that all combinations of those elements and/or method steps which perform substantially the same function in substantially the same way to achieve the same results are within the scope of the invention. Substitutions of elements from one described embodiment to another are also fully intended and contemplated. It is also to be understood that the drawings are not necessarily drawn to scale but that they are merely conceptual in nature. It is the intention, therefore, to be limited only as indicated by the scope of the claims appended hereto.--

In the Claims:

Please cancel claims 1-11 and add the following new claims:

--12. A method for producing a card-shaped information carrier, comprising the steps of: placing at least one card template which is to be sized into a hollow mold; and subjecting the template to a simultaneous action of pressure and heat for a predetermined time so that the template placed into the hollow mold is heated over at least one large area by heating plates, and in a peripheral, narrow, outer boundary region of the inserted template quantities of heat flowing off per se there are retained, blocked in, reflected and concentrated back onto the template.

13. A method according to claim 12, wherein the placing step includes placing a laminate template including a plurality of sized card layers into the hollow mold.

14. An apparatus for producing a sized, card-shaped information carrier comprising a frame defining a cavity in which card layers are placeable for lamination by pressure and heat, a peripheral region of the frame consisting of a material which is one of at most only slightly heat-conducting, reflects heat and concentrates heat back onto an inserted laminate, the frame having internal dimensions that correspond to final dimensions of the card-shaped carrier.

15. An apparatus as defined in claim 14, and further comprising heating plates arranged on both sides of the frame forming, by its internal dimensions, the cavity for the laminating process.

16. An apparatus as defined in claim 15, wherein one of the heating plates has external dimensions that correspond to the internal dimensions of the frame and is insertable with a prestressing action into said frame so as to produce the pressure required for laminating.

17. An apparatus as defined in claim 16, wherein the heating plates include an upper heating plate and a lower heating plate, the lower heating plate having the external dimensions that correspond to the internal dimensions of the frame, and further comprising a cooling body adjacent to the lower heating plate so that the cooling body is insertable together with the lower heating plate into the frame.

18. An apparatus as defined in claim 17, and further comprising prestressing means for prestressingly acting on the cooling body adjacent to the lower heating plate.

19. An apparatus as defined in claim 17, wherein the upper heating plate is arranged to close the cavity formed by the frame in a lid-like manner by way of a boundary lip projecting over the frame dimensions.



20. An apparatus as defined in claim 19, and further comprising pressure-producing means for pressing the frame and the upper heating plate firmly against one another so that between the upper heating plate, which closes the cavity in a lid-like manner, and the frame an intrinsic relative movement is possible.

21. An apparatus as defined in claim 19, wherein the frame has a reduction in material in a transitional edge region in order to increase specific contact pressure between a frame border edge and the upper heating plate.

22. An apparatus as defined in claim 21, wherein the reduction in material is formed by a peripheral, outer annular recess in the frame.

23. An apparatus as defined in claim 19, and further comprising dedicated prestressing means for pressing the frame by its transitional boundary edge against the boundary lip of the upper heating plate.

24. An apparatus as defined in claim 23, wherein the frame prestressing means are supported on the cooling body which is assigned to the lower heating plate and subjects the lower heating plate to pressure.--

IN THE ABSTRACT:

A method for producing information carriers in the form of cards, in particular credit cards, passes, identification cards, admittance cards etc., the laminating process including placing at least one card template which is to be sized, preferably a laminate consisting of a plurality of sized card layers, into a hollow mold and subjecting it to a simultaneous action of pressure and heat for a predetermined time. The material placed into the hollow mold is heated over at least one large area, as known per se by the use of heating plates, and in the peripheral, narrow, outer boundary region of the inserted material quantities of heat flowing off per se there are retained, blocked in, reflected and concentrated back onto the laminate template.

REMARKS

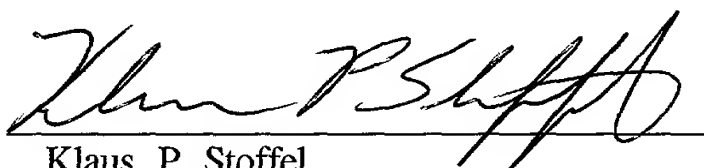
The present amendment is submitted prior to the issuance of a first Office Action and simultaneously with the filing of the present application.

With this amendment applicants have amended the specification, cancelled claims 1 to 11 and added new claims 12 to 24, all in an effort to place the application in better condition for examination.

Favorable action on the present application is respectfully requested.

Any additional fees or charges required at this time in connection with the application may be charged to our Patent and Trademark Office Deposit Account No. 03-2412.

Respectfully submitted,  
COHEN, PONTANI, LIEBERMAN & PAVANE

By:   
Klaus P. Stoffel  
Reg. No. 31,668  
551 Fifth Avenue, Suite 1210  
New York, N.Y. 10176  
(212) 687-2770

28 February 2001

IN THE SPECIFICATION:

Page 4, starting at line 11:

The method according to the invention achieves this object by [the defining features of claim 1; the object is further achieved by the defining features of claim 2. By] avoiding the discharge of heat energy in the boundary regions of the cavity of the laminator or, which is synonymous therewith, by maintaining and, as it were, concentrating the heat back through the mold onto the inserted card which is to be laminated or onto the laminate, it is ensured that said mold reaches the precise softening temperature required for the laminating process in the boundary regions at the same time as in the central region. This not only results in an elegant appearance of the entire finished product over its entire surface, but also in the certainty that the layers of the laminate which are to be laminated to one another are also satisfactorily connected to one another especially in the boundary region and that when an individual layer is inserted, the boundary region thereof obtains the same degree of lamination as the central region.

Page 6, line 1:

In the attached drawing, the sizing laminator is denoted by 12[; it] comprises an upper heating plate 2 and a lower heating plate 6 which, in conjunction with a frame 7, form a cavity which is used for holding the material to be laminated.

Page 7, line 1:

It can furthermore be seen that in order to apply the required pressure in the case of the exemplary embodiment illustrated in the drawing of a laminator 12, the lower heating plate 6 corresponds with the greatest possible accuracy to the internal dimensions of the frame 7 and therefore also to the final dimensions of the card which is to be produced, with the result that this heating plate can be inserted, from below in this case, into the cavity 7a which is formed by the hollow space of the frame 7.

Page 8, starting at line 1:

The upper cooling body 2 overlaps the frame 7 preferably on all sides by way of a lip 2a projecting all around, with the result that it rests, as it were, as a lid on the frame 7, in which case, with stationary positioning of the upper heating plate 2 together with the assigned cooling body 1, the frame 7 can be mounted in a moveable manner and is pressed by dedicated prestressing means 10 by an appropriate pressure from below against the upper heating plate 2. This firm bearing and boundary-side overlapping of the frame structure by the cooling-body lip 2a ensure that at least on the upper surface of the finished card a satisfactory, also [visual] visually attractive lamination is obtained together with a precise boundary edge for the card which is produced to size[; of]. Of course, in this completed version this is not possible for the lower boundary-edge corner region of the card, since the laminating pressure has to be applied and, for this purpose, the lower heating plate 6 has to have a clearance, even if only

very slight, from the inside dimensions of the frame in order to enable it to be able to be moved relative to the frame 7.

IN THE ABSTRACT:

A method for producing information carriers in the form of cards, in particular credit cards, passes, identification cards, admittance cards etc., the laminating process [comprising] including placing at least one card template which is to be sized, preferably a laminate consisting of a plurality of sized card layers, into a hollow mold and subjecting it to a simultaneous action of pressure and heat for a predetermined time[, consists in that, on the one hand, the]. The material placed into the hollow mold is heated over at least one large area, as known per se by the use of heating plates, and [in that, on the other hand,] in the peripheral, narrow, outer boundary region of the inserted material quantities of heat flowing off per se there are retained, blocked in, reflected and concentrated back onto the laminate template.

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**LAWYERS' AND MERCHANTS' TRANSLATION BUREAU, INC.****Legal, Financial, Scientific, Technical and Patent Translations****11 BROADWAY****NEW YORK, NY 10004****Certificate of Accuracy****TRANSLATION****From German into English**

**STATE OF NEW YORK** } s.s.:  
**COUNTY OF NEW YORK**

On this day personally appeared before me  
 who, after being duly sworn, deposes and states: Elisabeth A. Lucas

That he is a translator of the **German** and English languages by profession and  
 as such connected with the **LAWYERS' & MERCHANTS' TRANSLATION**  
**BUREAU;**

That he is thoroughly conversant with these languages;

That he has carefully made the attached translation from the original document  
 written in the **German** language; and

That the attached translation is a true and correct English version of such original,  
 to the best of his knowledge and belief.

**SUBSCRIBED AND SWORN TO BEFORE ME**  
**THIS**

**FEB 21 2001**

Susan Tapley  
 Notary Public, State of New York  
 No. 01TA4999804  
 Qualified in Queens County  
 Certificate filed in New York County  
 and Kings County  
 Commission Expires July 27, 2002

By Express Mail  
 No. EL 727707732 US

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 28 FEB 2001

PCT

WELTORGANISATION FÜR GEISTIGES EIGENTUM  
Internationales Büro

INTERNATIONALE ANMELDUNG VERÖFFENTLICHT NACH DEM VERTRAG ÜBER DIE  
INTERNATIONALE ZUSAMMENARBEIT AUF DEM GEBIET DES PATENTWESENS (PCT)

(51) Internationale Patentklassifikation<sup>7</sup>:

B32B 31/20, B42D 15/10

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(11) Internationale Veröffentlichungsnummer: WO 00/12308

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(30) Prioritätsdaten:

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DE

(71)(72) Anmelder und Erfinder: VOGT, Werner [CH/CH]; Lindenweg 3, CH-5453 Remetschwil (CH).

(74) Anwalt: OTTE, Peter; Otte &amp; Jakelski, Mollenbachstrasse 37, D-71229 Leonberg (DE).

(81) Bestimmungsstaaten: JP, US, europäisches Patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).

## Veröffentlicht

Mit internationalem Recherchenbericht.

Vor Ablauf der für Änderungen der Ansprüche zugelassenen Frist; Veröffentlichung wird wiederholt falls Änderungen eintreffen.

(54) Title: METHOD AND DEVICE FOR PRODUCING CARD-LIKE INFORMATION CARRIERS

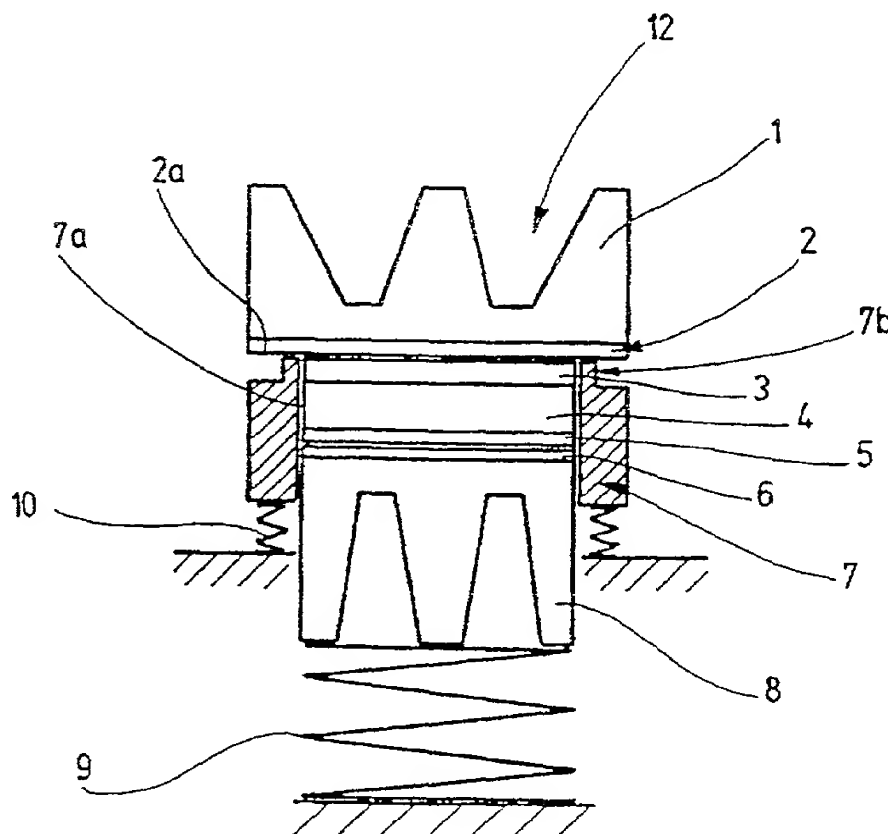
(54) Bezeichnung: VERFAHREN UND VORRICHTUNG ZUR HERSTELLUNG KARTENFÖRMIGER INFORMATIONSTRÄGER

## (57) Abstract

The invention relates to a method for producing card-like information carriers, notably credit cards, identity cards, identification cards, access cards, etc. For coating such cards at least one card shape to be reduced to the final size (3, 4, 5), preferably a laminate consisting of several layers of finished size, is introduced into a hollow mould and simultaneously subjected to pressure and heat for a defined period. According to said method the material introduced into the hollow mould is heated in the known manner on at least one large surface by heating plates (2, 6) and quantities of heat which would normally escape over the narrow, external peripheral areas of said material are retained, stored and reflected or refocused onto the laminate shape.

## (57) Zusammenfassung

Ein Verfahren zur Herstellung von kartenförmigen Informationsträgern, insbesondere Kreditkarten, Ausweiskarten, Identifikationskarten, Zugangskarten etc., wobei für den Kaschiervorgang mindestens eine auf Endmaß zu bringende Kartenform, vorzugsweise ein aus mehreren, Endmaß aufweisenden Kartenschichten (3, 4, 5) bestehendes Laminat in eine Hohlform eingebracht und für eine vorgegebene Zeit einer gleichzeitigen Druck- und Wärmeeinwirkung unterworfen wird, besteht darin, daß einerseits die Beheizung des in die Hohlform eingebrachten Materials auf mindestens einer Großfläche wie für sich bekannt durch den Einsatz von Heizplatten (2, 6) erfolgt, und daß andererseits im umlaufenden schmalen äußeren Randbereich des eingebrachten Materials dort an sich abfließende Wärmemengen aufgehalten, gedämmt, zurückgeworfen bzw. auf die Laminatform rückkonzentriert werden.





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Method and apparatus for producing information carriers in  
the form of cards

Prior art

Two types of laminators which are suitable for producing plastic cards consisting of layers (laminate) by laminating, i.e. bonding together the layers, are known.

A first group works with oversized laminate layers which are placed between two heating plates and are laminated by a conventionally simultaneous action of heat and pressure. The non-defined boundaries of the finished laminate mean that in a second processing step after cooling said laminate then also has to be cut, namely punched, to the final dimensions of the card.

A second group for laminating or heat sealing suitable plastic cards comprises a hollow mold or cavity which holds the laminate to be laminated and straight away has the final dimensions of the card, and heating plates which are arranged above and below the cavity into which, as is known, cooling bodies are in turn assigned, and also pressure-exerting means which press the heating plates onto one another in such a manner that a laminate held between

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them is subjected to an appropriately dimensioned action of pressure and temperature for the short period of action.

A finished card is therefore immediately produced, the laminating always taking place until shortly before or at the softening point of the inserted material to a sufficient extent that an integral, finished card can be removed from the cavity.

Laminators of this type from the second group, as are revealed, for example, in the specifications DE 39 16 708 A1, DE 42 06 342 A1 or EU 0 669 214 A1, have a peripheral frame which bounds the receiving cavity and whose internal dimensions correspond to the final dimensions of the card thereby rendering the subsequent punching processing step superfluous. Laminators of this type which produce a finished, sized card and which are also referred to in the following as sizing laminators, generally also have a pressure-compensating body so as to ensure a uniform surface structure of the finished card and, in particular, also a uniform action of pressure during the laminating process.

However, the fact that the borders of the inserted laminate layers necessarily bear against the sized mold parts during the laminating process and therefore a loss of heat inevitably also occurs in these regions, so that although a uniform action of pressure can be spoken of, this type of heat sealing, i.e. laminating, does not succeed in also ensuring a uniform action of heat in all regions of the

inserted material which is to be laminated, may be problematical in sizing laminators of this type.

The reason for this resides in the fact that only the heating plates on both sides have final dimensions, with the result that, when viewed purely physically, said heating plates necessarily already have a certain temperature gradient from the center to the boundary regions. However, this problem could be countered by an appropriately suitable distribution of the heating means - but what cannot be rectified in this manner, particularly if the shortness of the laminating time over which the action of pressure and temperature is maintained on the inserted laminate is included, is the fact that the boundary regions of the inserted material which is to be laminated which are pressed against the lateral, sized mold parts or come to bear against the latter lose heat in this region, with the result that the uniform distribution of the acting quantities of heat which is required over the entire surface of the laminate for a uniform laminating process cannot be ensured.

This means that the laminating possibly, or even with some degree of probability, does not take place completely, especially in the boundary region of the card, with the result that the layers which are to be bonded together may be broken open again from that point, for example for forgery purposes. This circumstance can also not be countered by simply heating more intensively overall, since this leads to excessive heating of the laminate in the central region, with

the result that an undesirable fusing together of the material and possibly even of any information, data and the like which is present could occur. Such a measure would also not be conducive for inserted electronic parts.

The invention is therefore based on the object of providing a remedy for this and also of ensuring a uniform laminating process including the boundary regions of the card in such laminators which are sized by way of their mold parts.

#### **Advantages of the invention**

The method according to the invention achieves this object by the defining features of claim 1; the object is further achieved by the defining features of claim 2. By avoiding the discharge of heat energy in the boundary regions of the cavity of the laminator or, which is synonymous therewith, by maintaining and, as it were, concentrating the heat back through the mold onto the inserted card which is to be laminated or onto the laminate, it is ensured that said mold reaches the precise softening temperature required for the laminating process in the boundary regions at the same time as in the central region. This not only results in an elegant appearance of the entire finished product over its entire surface, but also in the certainty that the layers of the laminate which are to be laminated to one another are also satisfactorily connected to one another especially in the boundary region and that when an individual layer is

inserted, the boundary region thereof obtains the same degree of lamination as the central region.

Such a result can be achieved in differing ways, for example by the mold having a peripheral, preferably also completely closed, frame made of a suitable material which conducts heat with difficulty or poorly, where the frame simultaneously forms, by means of its internal dimensions, the mold cavity for the laminate to be received. Such a frame may, for example, consist of a plastic which conducts heat poorly or very poorly, for example glass fiber reinforced epoxy resin; however, it may also have a suitable sandwich construction having an internal coating which conducts heat with difficulty, or it may consist entirely, for example, of a material, such as ceramic or other insulator material.

Appropriately designing the upper and outer heating plates to include the heat-deflecting properties of the frame of a sizing laminator of this type then enables the inserted laminate to be uniformly and completely laminated over its entire surface and therefore including its boundary regions.

### **Drawing**

The drawing shows in a cross-sectional diagram one possible construction of a laminator together with inserted card components and a heat-insulating mold frame.

### **Description of the exemplary embodiments**

The basic concept of the present invention resides in designing the cavity of a sizing laminator in such a manner that during the laminating process, i.e., for example, during the bonding together of a plurality of inserted card laminate layers or the laminating of an individual, thick plastic layer, the boundary regions of the card manufactured to this extent to size are able to make full use for the laminating process of the heat energy supplied to the heating plates, i.e. heat is prevented from being discharged via the boundary regions and the mold parts which are necessarily present there and are used as a bearing. For this purpose, a material which conducts heat very poorly is preferably provided for a frame forming the boundaries of the cavity, with the result that the quantity of heat which is supplied remains within the cavity and a satisfactory laminating process of the inserted material (laminate) is ensured at all locations.

In the attached drawing, the sizing laminator is denoted by 12; it comprises an upper heating plate 2 and a lower heating plate 6 which, in conjunction with a frame 7, form a cavity which is used for holding the material to be laminated.

This material to be laminated usually concerns ready-sized card layers, preferably PVC layers, for a card to be laminated, which layers form a laminate and are therefore inserted as a stack comprising the layers 3, 4 and 5 into the hollowed space of the mold, i.e. the cavity of the laminator.

It can furthermore be seen that in order to apply the required pressure in the case of the exemplary embodiment illustrated in the drawing of a laminator 12, the lower heating plate 6 corresponds with the greatest possible accuracy to the internal dimensions of the frame and therefore also to the final dimensions of the card which is to be produced, with the result that this heating plate can be inserted, from below in this case, into the cavity 7a which is formed by the hollow space of the frame 7.

Since, in order to carry out a correct laminating process, i.e. initially rapid feeding in of the required quantities of heat under pressure for the laminating process and then just as rapid dissipation of the heat so that the product which is produced can be removed in solid form from the laminator, the two heating plates 2 and 6 bear cooling bodies 1 and 8 on the side which faces away from the cavity, the lower cooling body 8 here also has approximately the dimensions of the card in order likewise to be able to be inserted into the cavity.

In the exemplary embodiment illustrated, the pressure required for the laminating process is applied via the lower heating plate 6 in conjunction with the feeding in of heat, with the result that appropriate, pressure-producing means, indicated in the drawing as a prestressing spring 9 representing all other options, act on the lower cooling body 8.

The upper cooling body 2 overlaps the frame 7 preferably on all sides by way of a lip 2a projecting all around, with the result that it rests, as it were, as a lid on the frame 7, in which case, with stationary positioning of the upper heating plate 2 together with the assigned cooling body 1, the frame 7 can be mounted in a moveable manner and is pressed by dedicated prestressing means 10 by an appropriate pressure from below against the upper heating plate 2. This firm bearing and boundary-side overlapping of the frame structure by the cooling-body lip 2a ensure that at least on the upper surface of the finished card a satisfactory, also visual attractive lamination is obtained together with a precise boundary edge for the card which is produced to size; of course, in this completed version this is not possible for the lower boundary-edge corner region of the card, since the laminating pressure has to be applied and, for this purpose, the lower heating plate 6 has to have a clearance, even if only very slight, from the inside dimensions of the frame in order to enable it to be able to be moved relative to the frame 7.

The frame 7 itself consists of a material which conducts heat only slightly or only very slightly or is provided, at least on its inner surface, i.e. on the regions facing the laminate to be laminated, with a coating which conducts heat with appropriate difficulty. For better understanding, in the graphical illustration the inserted laminate of the card which consists of the three layers 3, 4



and 5 is illustrated excessively thickly; however, in every case the material flows and fuses together, with the result that the hollow space of the mold or the cavity of the laminator is completely filled by the card material or the laminate during the laminating process.

The frame characteristics of conducting heat poorly, deflecting heat, reflecting heat and of concentrating the quantity of heat transferred from the heating bodies to the inserted laminate back onto the laminate means that during the laminating process, which is actually usually finished in seconds, there is no significant transfer of heat energy from the cavity or by the laminate material or card material to the inner sized mold wall of the frame 7, with the result that uniform heating and uniform bonding, i.e. laminating, of all of the layers of the card is ensured with a satisfactory, external appearance also being obtained.

As the drawing illustrates, in the overlapping region of the upper heating plate 2 the frame 7 can have a peripheral incision or an external recess 7b by means of which the frame mass is clearly smaller at the point where the laminating process takes place after the inserted laminate has been compressed, with the result that, for example, the heat absorption of the frame is thereby also reduced, in addition to its heat-deflecting, reflecting or heat-insulating characteristics.

However, the main reason for this reduction in material is the increase obtained by this means in the

specific pressure exerted by the prestressing means 10 between the upper heating plate and the upper frame boundary edge, which abuts from below against the heating plate, at given pressure values. Particularly good sealing of the cavity at this location and a clean, highly precise mold border are obtained in this manner. This is of importance for the fusing together of the laminate material which takes place in this region, resulting here in a clean, cut-like boundary-edge transition for the finished edge. It is therefore also recommended to grind the edge transition finely in a similar manner to a flat piston ring.

Furthermore, it may be expedient to select for the prestressing means 10 for the frame a support against the lower cooling body, since the higher the pressure which is exerted by the heating plates, the higher the frame pressure (against the upper heating plate) also has to be so as to avoid the material fusing together in the transitional boundary-edge region.

**Patent claims**

1. A method for producing information carriers in the form of cards, in particular credit cards, passes, identification cards, admittance cards etc., the laminating process comprising placing at least one card template which is to be sized, preferably a laminate consisting of a plurality of sized card layers, into a hollow mold and subjecting it to a simultaneous action of pressure and heat for a predetermined time, wherein, on the one hand, the material placed into the hollow mold is heated over at least one large area, as known per se by the use of heating plates, and wherein, on the other hand, in the peripheral, narrow, outer boundary region of the inserted material quantities of heat flowing off per se there are retained, blocked in, reflected and concentrated back onto the laminate template.

2. An apparatus (laminator) for producing sized information carriers in the form of cards, in particular credit cards, passes, identification cards, admittance cards etc., in which card layers placed into the hollow space of the laminator are laminated by the action of pressure and heat, wherein the cavity (7a), forming the hollow space, of the laminator (12) has a peripheral frame which consists of a material which is only slightly heat-conducting, if at all, reflects heat or concentrates heat back onto the inserted laminate, and whose internal dimensions correspond to the final dimensions of the card.

3. The apparatus as claimed in claim 2, wherein heating plates (2, 6) are arranged on both sides of the frame (7) forming, by its internal dimensions, the cavity (7a) for the laminating process.

4. The apparatus as claimed in claim 2 or 3, wherein one of the heating plates (lower heating plate 6) corresponds with its external dimensions to the internal dimensions of the frame (7) and can be inserted with a prestressing action into said frame, preferably together with associated cooling bodies (8), in order to produce the pressure required for the laminating process.

5. The apparatus as claimed in claim 4, wherein prestressing means (9) act on the cooling body (8) adjacent to the lower heating plate (6).

6. The apparatus as claimed in one of claims 2 to 5, wherein the upper heating plate (2) closes the cavity (7a), which is formed by the frame (7), in a lid-like manner by way of a boundary lip (2a) projecting over the frame dimensions.

7. The apparatus as claimed in one of claims 2 to 6, wherein between the heating plate (2), which closes the cavity (7a) in a lid-like manner, and the frame (7) an intrinsic relative movement is possible by way of further, pressure-producing means (10) which press the frame (7) and covering heating plate (2) firmly against one another.

8. The apparatus as claimed in one of claims 2 to 7, wherein in order to increase the specific contact pressure between the frame border edge and covering heating plate (2),

the frame (7) has a reduction in material in the transitional edge region.

9. The apparatus as claimed in claim 8, wherein the reduction in material is formed by a peripheral, outer annular recess (7b).

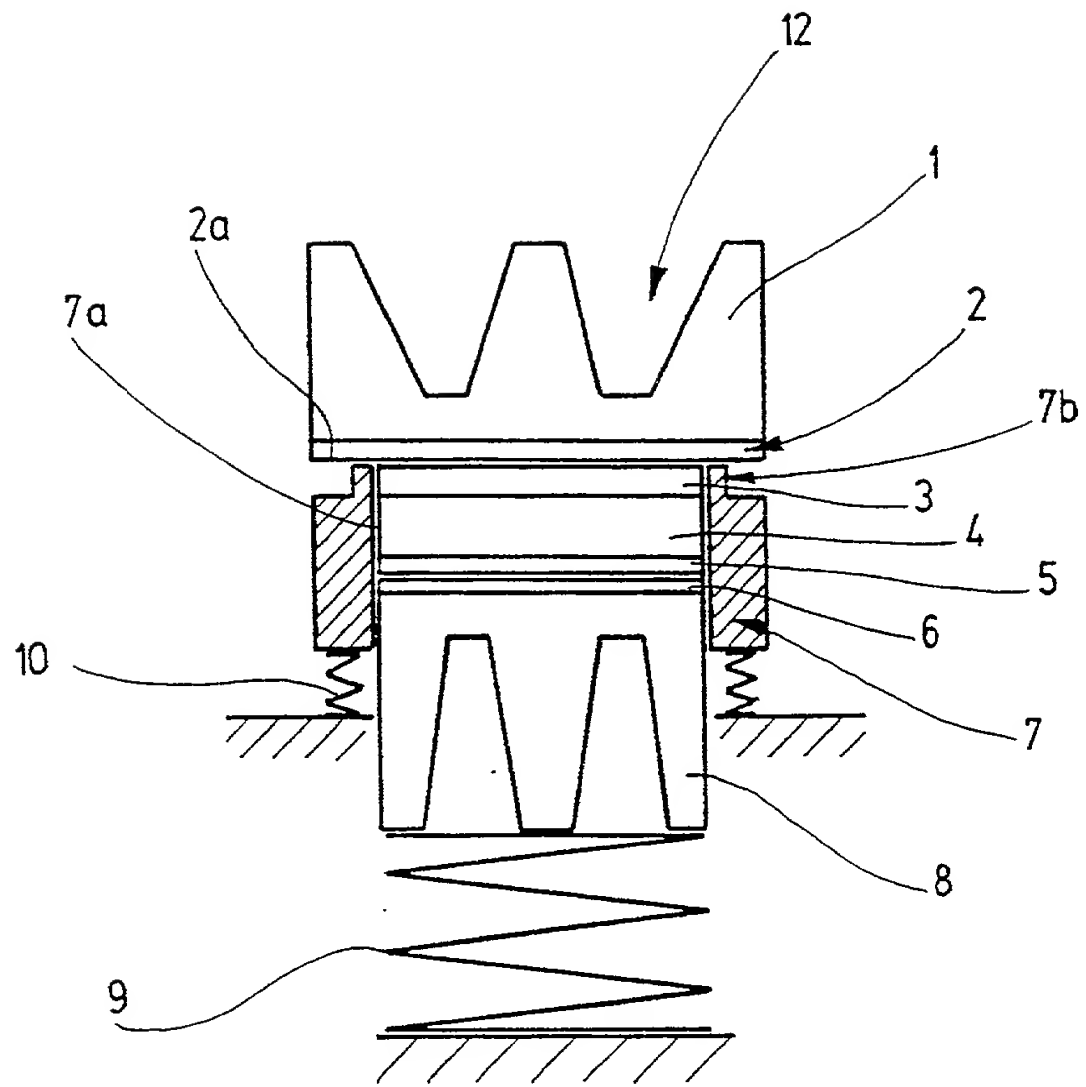
10. The apparatus as claimed in one of claims 2 to 9, wherein the frame (7) is pressed by its transitional boundary edge against the overlapping heating-plate lip (2a) by dedicated prestressing means (10).

11. The apparatus as claimed in claim 10, wherein the frame prestressing means (10) are supported on the cooling body (8) which is assigned to the lower heating plate (2) and subjects the latter to pressure.

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## **Abstract**

A method for producing information carriers in the form of cards, in particular credit cards, passes, identification cards, admittance cards etc., the laminating process comprising placing at least one card template which is to be sized, preferably a laminate consisting of a plurality of sized card layers, into a hollow mold and subjecting it to a simultaneous action of pressure and heat for a predetermined time, consists in that, on the one hand, the material placed into the hollow mold is heated over at least one large area, as known per se by the use of heating plates, and in that, on the other hand, in the peripheral, narrow, outer boundary region of the inserted material quantities of heat flowing off per se there are retained, blocked in, reflected and concentrated back onto the laminate template.



**COMBINED DECLARATION FOR PATENT APPLICATION AND POWER OF ATTORNEY**  
Includes Reference to PCT International Applications

Attorney's Docket  
No. 4595-18PUS

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

**METHOD AND DEVICE FOR PRODUCING CARD-LIKE INFORMATION CARRIERS**

the specification of which (check only one item below)

☒ is attached hereto

☐ was filed as United States application

Serial No. \_

on \_

and was amended

on \_ (if applicable).

☒ was filed as PCT international application

Number PCT/IB99/01560

on August 27, 1999

and was amended under PCT Article 19

on \_ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the patentability of the application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed.

**PRIOR FOREIGN/PCT APPLICATIONS AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. 119:**

Country (if PCT, indicate "PCT")	Application Number	Date of Filing (day, month, year)	Priority Claimed Under 35 U.S.C. 119	
Germany	198 39 517,5	August 29, 1998	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
PCT	PCT/IB99/01560	August 27, 1999	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
			<input type="checkbox"/> YES	<input type="checkbox"/> NO
			<input type="checkbox"/> YES	<input type="checkbox"/> NO
			<input type="checkbox"/> YES	<input type="checkbox"/> NO
			<input type="checkbox"/> YES	<input type="checkbox"/> NO
			<input type="checkbox"/> YES	<input type="checkbox"/> NO

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**Combined Declaration for Patent Application and Power of Attorney (Continued)**  
(Includes Reference to PCT International Applications)Attorney's Docket No.  
4595-18PUS

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) or PCT international application(s) designating the United States of America that is/are listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in that/those prior application(s) in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application(s) and the national or PCT international filing date of this application:

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U.S. APPLICATIONS			STATUS (check one)		
U.S. APPLICATION NUMBER	U.S. FILING DATE		PATENTED	PENDING	ABANDONED
PCT APPLICATIONS DESIGNATING THE U.S.					
PCT APPLICATION NO.	PCT FILING DATE	U.S. SERIAL NUMBERS ASSIGNED (if any)			
PCT/IB99/01560	August 27, 1999			X	

**POWER OF ATTORNEY:** As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith (*List name and registration number*)

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Combined Declaration for Patent Application and Power of Attorney (Continued) (Includes Reference to PCT International Applications)				Attorney's Docket No. 4595-18PUS
2 0 3	FULL NAME OF INVENTOR	FAMILY NAME	FIRST GIVEN NAME	SECOND GIVEN NAME
	RESIDENCE, CITIZENSHIP	CITY	STATE OR FOREIGN COUNTRY	COUNTRY OF CITIZENSHIP
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<p>I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under §1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.</p>				
SIGNATURE OF INVENTOR 201 Feb. 21, 2001		SIGNATURE OF INVENTOR 202		SIGNATURE OF INVENTOR 203
DATE		DATE		DATE